RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 52-02-11

Log Event A

Borehole Information

Farm : TY	**Tank :** TY-102	**Site Number :** 299-W10-161
N-Coord : 42,638	**W-Coord :** 75,980	**TOC Elevation :** 670.00
Water Level, ft : 95.60	**Date Drilled :** 7/31/1975	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 45	
Type : Steel-welded	Thickness : 0.250	ID, in. : 4
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
The borehole was originally drilled in 1975 to a depth of 45 ft. It was perforated along the bottom 3 ft of the borehole. The casing size is assumed to be a schedule-40, 6-in. steel tubing, which was typically used during the mid-1970s. In 1977, the borehole was extended to a depth of 105 ft and completed to 100 ft with a 4-in. casing. According to the driller's records, the 4-in. casing was not perforated but was grouted. Approximately 6 gal of grout was added to the bottom of the borehole.

Water was encountered in the borehole at a depth of 95.6 ft.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 04/1996	**Calibration Reference :** GJPO-HAN-5	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 5/10/1996	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 61.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 5/13/1996	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 95.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 60.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787 Analysis Date : 1/27/1997

Analysis Notes :

This borehole was logged in two log runs. The pre-survey field verification spectra from the first log run did not pass the acceptance criteria established for the peak shape and system efficiency. A nonconformance report issued in August 1996 (N-96-05) identified this failure as a power supply malfunction that resulted in a low detector bias voltage supplied to the logging tool. This malfunction occurred in the mornings immediately following system start-up, but ceased after an extra long warm-up period (about 1 to 2 hours). That report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically understated by about 10 percent. Therefore, the data from the first log run may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectra for both log runs and the pre-survey field verification spectra for log run two passed the acceptance criteria for the peak shape and system efficiency, providing evidence that the logging system was operating appropriately after an initial warm-up time. The energy calibration and peak-shape calibration from verification spectra that successfully met the established acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification.

Casing correction factors for a 0.280-in. thick steel casing were applied during analysis between 0 and 45 ft. The interval between 45.5 and 95 ft required a casing correction factor for a 0.237-in. thick steel casing, which was not available. Therefore, a casing correction factor for a 0.250-in.-thick steel casing was applied. The difference in the casing-correction factors between 45.5 and 95 ft will cause the radionuclide concentrations to be slightly overestimated.

The only man-made radionuclide detected in this borehole was Cs-137. The presence of Cs-137 contamination was detected almost continuously from the ground surface to about 4.5 ft, at 10 ft, and continuously between 41 and 52.5 ft. The maximum Cs-137 concentration was 54 pCi/g at 43 ft.

K-40 concentrations increase at about 45 ft and increase again at about 50 ft. The Th-232 and U-238 concentrations begin to increase at about 90 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank TY-102.

Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring radionuclides (KUT). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

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A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A time-sequence plot was created from the historical gross gamma log data and is included with the SGLS logs.